AMENDMENTS TO CLAIMS:

The listing of claims below will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1. (Currently Amended) A method for improving resolution of a digital representation having a plurality of text or graphics pixels, comprising the steps of:

identifying a text or graphics pixel on a boundary of a text or graphics object of the digital representation; and

for each text or graphics pixel identified as on the boundary

tracing a group of pixels, including the initial boundary-identified pixel, that constitute a local boundary segment and constructing ~~a chain code~~an identifier indicative of the number and relative locations of the pixels of that local boundary segment;

parameterizing and smoothing that local boundary segment, resulting in a new local boundary segment, without consideration of non-boundary segment data, by ~~accessing~~ computing instructions ~~stored in a look-up table~~ for parameterizing and smoothing that local boundary segment ~~using the constructed chain code as an index to the look-up table~~; and

rendering the parameterized and smoothed boundary segment to ~~improve~~ increase the resolution of the text or graphics object.

2. (Currently Amended) The method of claim 1, wherein the instructions are pre-computed, stored in a look-up table, indexed by the corresponding identifier, and directly accessed during the parameterizing and smoothing of that local boundary segment~~tracing step comprises searching and identifying each new pixel in the group with respect to a background neighbor pixel that is propagated from a penultimate identified pixel to a just identified pixel~~.

3. (Canceled)

4. (Currently Amended) The method of claim ~~2~~33, wherein the tracing step comprises identifying first and second contiguous sub-groups of pixels, each

starting with the initial pixel and extending in first and second directions respectively relative to the propagated background neighbor pixel and, if available, a just-identified pixel in that sub-group to construct the ~~chain-code~~identifer.

5. (Currently Amended) The method of claim ~~2~~33, wherein the tracing step comprises tracing N pixels in a first direction and N pixels in a second direction to construct the ~~chain-code~~identifier based on a pre-determined set of rules used in the tracing step.

6. (Currently Amended) The method of claim 2, wherein the stored instructions on parameterizing and smoothing comprise a differential stored at a location in the pre-computed look-up table indexed by the corresponding ~~chain-code~~identifier, the differential representing a difference between the location of at least one pixel in the new local boundary segment and the location of that pixel in the corresponding un-parameterized and un-smoothed local boundary segment.

7. (Currently Amended) The method of claim 2, wherein the stored instructions on parameterizing and smoothing comprise general occupancy information stored at a location in the pre-computed look-up table indexed by the corresponding ~~chain-code~~identifier, the general occupancy information representing a difference between the location of the new local boundary segment and the location of the corresponding un-parameterized and un-smoothed local boundary segment.

8. (Original) The method of claim 1, wherein the identifying step comprises identifying each text and graphics pixel on a boundary of a text or graphics object of the digital representation, and performing the tracing, parameterizing and smoothing, and rendering for each boundary-identified pixel.

9. (Currently Amended) An apparatus for improving resolution of a digital representation having a plurality of text or graphics pixels, the apparatus comprising:

means for identifying a text or graphics pixel on a boundary of a text or graphics object of the digital representation; and

means for tracing a group of pixels, including an initial boundary-identified pixel, that constitute a local boundary segment and constructing ~~a chain code~~an identifier indicative of the number and relative locations of the pixels of that local boundary segment;

means for parameterizing and smoothing that local boundary segment to generate a new local boundary segment, without consideration of non-boundary segment data, by ~~accessing~~ computing instructions ~~stored in a look-up table~~ for parameterizing and smoothing that local boundary segment ~~using the constructed chain code as an index to the look-up table~~; and

means for rendering the parameterized and smoothed boundary segment to ~~improve~~ increase the resolution of the text or graphics object.

10. (Currently Amended) The apparatus of claim 9, wherein the instructions are pre-computed, stored in a look-up table, indexed by the corresponding identifier, and directly accessed during the paramterizing and smoothing of that local boundary segment~~means for tracing comprises means for searching and identifying each new pixel in the group with respect to a background neighbor pixel that is propagated from a penultimate identified pixel to a just identified pixel~~.

11. (Canceled)

12. (Currently Amended) The apparatus of claim ~~10~~34, wherein the tracing means is configured to identify first and second contiguous sub-groups of pixels, each starting with the initial pixel and extending in first and second directions respectively relative to the propagated background neighbor pixel and, if available, a just-identified pixel in that sub-group to construct the ~~chain code~~identifier.

13. (Currently Amended) The apparatus of claim ~~10~~34, wherein the tracing means is configured to trace N pixels in a first direction and N pixels in a second direction to construct the ~~chain code~~identifier.

14. (Currently Amended) The apparatus of claim 10, wherein the stored instructions on parameterizing and smoothing comprise a differential stored at a location in the pre-computed look-up table indexed by the corresponding ~~chain-code~~identifier, the differential representing a difference between the location of at least one pixel in the new local boundary segment and the location of that pixel in the corresponding un-parameterized and un-smoothed local boundary segment.

15. (Currently Amended) The apparatus of claim 10, wherein the stored instructions on parameterizing and smoothing comprise general occupancy information stored at a location in the pre-computed look-up table indexed by the corresponding ~~chain-code~~identifier, the general occupancy information representing a difference between the location of the new local boundary segment and the location of the corresponding un-parameterized and un-smoothed local boundary segment.

16. (Original) The apparatus of claim 9, wherein the identifying means is configured to identify each text and graphics pixel on a boundary of a text or graphics object of the digital representation, and wherein the tracing, parameterizing and smoothing, and rendering means are each configured to operate on each boundary-identified pixel.

17. (Currently Amended) A machine-readable medium having a program of instructions for directing a machine to improve resolution of a digital representation having a plurality of text or graphics pixels, the program of instructions comprising:

instructions for identifying a text or graphics pixel on a boundary of a text or graphics object of the digital representation; and

for each text or graphics pixel identified as on the boundary

instructions for tracing a group of pixels, including the initial boundary-identified pixel, that constitute a local boundary segment and constructing ~~for a chain code~~an identifier indicative of the number and relative locations of the pixels of that local boundary segment;

instructions for parameterizing and smoothing that local boundary segment, resulting in a new local boundary segment, without consideration of non-boundary segment data, by ~~accessing~~ computing directions ~~stored in a look-up table~~ for parameterizing and smoothing that local boundary segment ~~using the constructed chain code as an index to the look-up table~~; and

instructions for rendering the parameterized and smoothed boundary segment to ~~improve~~ increase the resolution of the text or graphics object.

18. (Currently Amended) The machine-readable medium of claim 17, wherein the directions are pre-computed, stored in a look-up table, indexed by the corresponding identifier, and directly accessed during the parameterizing and smoothing of that local boundary segment~~tracing instructions comprises instructions for searching and identifying each new pixel in the group with respect to a background neighbor pixel that is propagated from a penultimate identified pixel to a just identified pixel~~.

19. (Canceled)

20. (Currently Amended) The machine-readable medium of claim ~~18~~35, wherein the tracing instructions comprises identifying first and second contiguous sub-groups of pixels, each starting with the initial pixel and extending in first and second directions respectively relative to the propagated background neighbor pixel and, if available, a just-identified pixel in that sub-group to construct the ~~chain code~~identifier.

21. (Currently Amended) The machine-readable medium of claim ~~18~~35, wherein the tracing instructions comprises instructions for tracing N pixels in a first direction and N pixels in a second direction to construct the ~~chain code~~identifier based on a pre-determined set of rules used in the tracing.

22. (Currently Amended) The machine-readable medium of claim 18, wherein the stored directions on parameterizing and smoothing comprise a differential stored at a location in the pre-computed look-up table indexed by the corresponding ~~chain code~~identifier, the differential representing a difference between the

location of at least one pixel in the new local boundary segment and the location of that pixel in the corresponding un-parameterized and un-smoothed local boundary segment.

23. (Currently Amended) The machine-readable medium of claim 18, wherein the stored directions on parameterizing and smoothing comprise general occupancy information stored at a location in the pre-computed look-up table indexed by the corresponding ~~chain code~~identifier, the general occupancy information representing a difference between the location of the new local boundary segment and the location of the corresponding un-parameterized and un-smoothed local boundary segment.

24. (Original) The machine-readable medium of claim 17, wherein the identifying instructions comprises identifying each text and graphics pixel on a boundary of a text or graphics object of the digital representation, and performing the tracing, parameterizing and smoothing, and rendering for each boundary-identified pixel.

Claims 25-32 (Canceled)

33. (New) The method of claim 1, wherein the tracing step comprises searching and identifying each new pixel in the group with respect to a background neighbor pixel that is propagated from a penultimate-identified pixel to a just-identified pixel.

34. (New) The apparatus of claim 9, wherein the means for tracing comprises means for searching and identifying each new pixel in the group with respect to a background neighbor pixel that is propagated from a penultimate-identified pixel to a just-identified pixel.

35. (New) The machine-readable medium of claim 17, wherein the tracing instructions comprises for searching and identifying each new pixel in the group with respect to a background neighbor pixel that is propagated from a penultimate-identified pixel to a just-identified pixel.